

Appl. No. 10/017,333
Amdt. dated February 24, 2004
Reply to Office action of October 24, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A cleaning system for the condenser of a refrigeration unit, the system comprising:

a compressor including a motor operating in a normal operating mode during a refrigeration cooling cycle,

a condenser,

a cooling fan including a fan blade;

a motor drive system for driving the fan;

a power source supplying power to the cleaning system during the refrigeration cooling cycle; and

control means for running the fan motor drive system during the refrigeration cooling cycle at a first selected speed in a forward direction to direct air toward the condenser for a first predetermined period of time and at a second selected speed in a reverse direction to direct air away from the condenser for a second predetermined period of time, the first and second periods of time being tolled when power is not supplied to the cleaning system, the speeds and the time periods being effective to prevent formation of lint on the condenser.

Claim 2 (original): A cleaning system as defined in claim 1, wherein:

the first selected speed is less than the second selected speed.

Claim 3 (original): A cleaning system as defined in claim 1, wherein:

the first predetermined time period is longer than the second predetermined time period.

Claim 4 (previously presented): A cleaning system as defined in claim 2, wherein:

the fan is continuously run at the lower speed and the fan reversed several times a day to run at the higher speed in the opposite direction during the refrigeration cooling cycle when power is supplied to the cleaning system.

Claim 5 (previously presented): A cleaning system as defined in claim 1, wherein:

the first selected speed is about 1500 rpm and the second selected speed is about 2000 rpm, and the first time period is about 8 hours and the second time period is about 14 minutes.

Claim 6 (previously presented): A cleaning system as defined in claim 1, wherein:

the reversing motor drive system is powered directly off terminals associated with the compressor, thereby providing power to the motor drive system during the normal operating mode of the compressor.

Claim 7 (previously presented): A cleaning system as defined in claim 1, wherein:

the control means includes a timer for monitoring and accumulating data representative of compressor running time during the refrigeration cooling cycle, the timer causing the motor drive system to drive the fan in the forward or reverse direction based upon the duration of compressor running time.

Claim 8 (previously presented): A cleaning system as defined in claim 7, wherein:

the first selected speed is about 1500 rpm and the second selected speed is about 2000 rpm, the timer causing the motor drive system to run in the reverse direction for about 14 minutes after every 8 hours of compressor running time.

Claim 9 (original): A cleaning system as defined in claim 1, wherein:

the reversing motor drive system includes a solid state commutated motor.

Claim 10 (original): A cleaning system as defined in claim 9, wherein:

the first selected speed is less than the second selected speed.

Claim 11 (previously presented): A cleaning system as defined in claim 10, wherein:

the first selected speed is about 1500 rpm and the second selected speed is about 2000 rpm, and the first time period is about 8 hours and the second time interval is about 14 minutes.

Claim 12 (previously presented): A cleaning system as defined in claim 1, wherein:

the reversing motor drive system includes a solid state commutated motor, an electromechanical timer electrically connected to terminals of the compressor motor for monitoring and accumulating data representative of compressor running time during the refrigeration cooling cycle, an AC to DC converter for processing power supplied by the power source into controlled, stabilized power supplied to the solid state commutated motor, and control circuitry for controlling operation of the converter.

Claim 13 (Previously presented): A cleaning system as defined in claim 1, wherein:

the motor drive system includes a reversible permanent split capacitor motor.

Claim 14 (Previously presented): A cleaning system as defined in claim 13, wherein:
the first selected speed and the second selected speed are equal.

Claim 15 (Previously presented): A cleaning system as defined in claim 14, wherein:
the first selected speed and the second selected speed are about 1500 rpm.

Claim 16 (currently amended): A kit for retrofitting a refrigerator unit of the type comprising a compressor operating in a normal operating mode during a refrigeration cooling cycle when power is supplied to the unit, a condenser, a power source supplying power to the unit during the refrigeration cooling cycle and an original condenser fan motor and a fan blade with a condenser cleaning system, the condenser cleaning system kit comprising:

a replacement reversible condenser fan motor for driving the fan blade in a forward direction and a reverse direction ~~electrically connectable to the fan blade in a same manner as the original condenser fan motor~~; and

control means electrically connectable to the replacement fan motor for running the replacement fan motor during a refrigeration cooling cycle when power is supplied to the compressor alternately at a first selected speed in the forward direction to direct air toward the condenser for a first predetermined period of time,

and in ~~at~~ the reverse direction of the motor to direct air away from the condenser at a second selected speed for a second predetermined period of time, the first and second periods of time being delayed when power is not supplied to the compressor and resumed when power is supplied to the compressor, the speeds and the time periods being effective to prevent formation of lint, the control means including a timer electrically connectable to terminals of the compressor for monitoring and accumulating data representative of compressor running time during the refrigeration cooling cycle.

Claim 17 (original) A kit as defined in claim 16, wherein:

the reversible motor is a solid state commutated motor.

Claim 18 (withdrawn) A kit as defined in claim 16, wherein:

the reversible motor is a reversible permanent split capacitor motor.

Claim 19 (withdrawn) A method of retrofitting a refrigerator unit, of the type comprising a compressor, a condenser, a condenser fan having an existing motor and a blade, with a condenser cleaning system including a reversible condenser fan motor and a timer, the method comprising the steps of:

disconnecting a power supply to the refrigerator unit;

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disconnecting existing condenser fan motor leads from the compressor;
removing the existing condenser fan motor;
removing the condenser fan blade;
installing the condenser fan blade in the same direction on the reversible condenser fan motor;
installing the reversible condenser fan motor on the refrigerator unit;
mounting the timer on the refrigerator unit;
connecting the reversible condenser fan motor and timer power leads to the same compressor terminals from which the existing condenser fan motor leads were removed; and
reconnecting the power supply to the refrigerator unit.

Claim 20 (currently amended): A kit as defined in claim 17, wherein the timer causes the replacement fan motor to drive the fan in the forward or reverse direction based upon the duration of compressor running time ~~is an~~ electromechanical timer.

Claim 21 (currently amended): A kit as defined in claim 17, wherein the first selected speed is less than the second selected speed ~~the control means further includes an AC to DC converter for processing power supplied to the refrigerator unit by a power~~

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~~source into controlled, stabilized power supplied to the solid state commutated motor, and
control circuitry for controlling operation of the converter.~~

Claims 22 and 23 (cancelled)

Claim 24 (currently amended) A cleaning system for the condenser of a
refrigeration unit, the cleaning system comprising:

a power source supplying power to the cleaning system during a refrigeration
cooling cycle;

a thermostatically controlled switching device allowing for supply of power from
the power source to the cleaning system during the refrigeration cooling cycle in
response to temperature variations in the refrigeration unit;

a compressor including a motor operating in a normal operating mode during the
refrigeration cooling cycle;

a condenser having refrigerant delivered thereto by the compressor;

a cooling fan including a fan blade;

a motor drive system for driving the fan alternately in a forward direction to direct air
toward the condenser and in a reverse direction to direct air away from the condenser;

and

a control system for monitoring operation of the compressor motor and for running the motor drive system when power is supplied to the cleaning system during the refrigeration cooling cycle alternately in the forward direction at a first speed for a first predetermined period of time and in the reverse direction at a second speed for a second predetermined period of time based upon the duration of compressor running time during the refrigeration cooling cycle, the speeds and the time periods being effective to prevent formation of lint on the condenser; the control system including a timing device for accumulating and storing data representative of compressor running time during the refrigeration cooling cycle; The cleaning system as defined in claim 23, wherein the control system ~~causing~~causes the fan to operate in the forward direction until the accumulated compressor running time reaches the first predetermined time period, the control system causing the fan to operate in the reverse direction after the first predetermined time period is reached, the control system causing the fan to operate in the reverse direction until the accumulated compressor running time reaches the second predetermined time period, the control system causing the fan to operate in the forward direction after the second predetermined time period is reached.

Claim 25 (currently amended): The cleaning system as defined in claim 24~~23~~, wherein the timing device includes an electromechanical timer.

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Claim 26 (currently amended): The cleaning system as defined in claim 2422, wherein the motor drive system includes a solid state commutated motor.

Claim 27 (previously presented): The cleaning system as defined in claim 26, wherein the first speed is less than the second speed.

Claim 28 (currently amended): The cleaning system as defined in claim 2422, wherein the first predetermined time period is longer than the second predetermined time period.

Claim 29 (new): A cleaning system for the condenser of a refrigeration unit, the system comprising:

- a compressor including a motor operating in a normal operating mode during a refrigeration cooling cycle,

- a condenser,

- a cooling fan including a fan blade;

- a motor drive system for driving the fan;

- a power source supplying power to the cleaning system during the refrigeration cooling cycle; and

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control means for running the fan motor drive system during the refrigeration cooling cycle when power is supplied to the compressor alternately at a first selected speed in a forward direction to direct air toward the condenser for a first predetermined period of time and at a second selected speed in a reverse direction to direct air away from the condenser for a second predetermined period of time, the first and second periods of time being delayed when power is not supplied to the compressor and resumed when power is supplied to the compressor, the speeds and the time periods being effective to prevent formation of lint on the condenser.